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~~ARMATURE FOR AN ELECTROMOTIVE DEVICE~~

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ABSTRACT

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An armature apparatus for brushless and brush type electric motors and a manufacturing method for same armature. The armature represents and improved design for electric motors having a rigid, thinwall configuration and high conductor packing density in the magnetic flux air gap that results in motors with higher torque and speed capabilities and the ability to operate at higher temperature than conventional motor designs. The armature is fabricated from pre-machined copper sheet metal parts with an electrical conductor pattern of numerous axially extending conductive bands. These precision machined sheet metal parts are cold rolled to form two work hardened cylinders, each cylinder having a complimentary pattern of electrically conductive bands creating a half-electric circuit. The two cold rolled metal cylinders are sized such that the smaller diameter inner cylinder fits inside the larger diameter outer cylinder. The surface of the inner cold rolled cylinder is over-wrapped with fiber strands, woven in several layers to provide physical spacing and electrical insulation. The fiber wrapped inner cylinder is placed inside the larger outer cylinder radially oriented to ensure that an electrical circuit is created by welding the inner and outer cylinder at the conductor tabs. The surface of this cylinder assembly is over-wrapped with ~~fiber strands, woven in several layers and holding the two~~

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5 cylinders together. The entire armature coil is encapsulated
in a potting material to add composite strength and electrical
insulation. The result of this assembly is a freestanding,
ironless core, inductive armature coil for brushless or brush
type electric motors.

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